Appendix H.

Vegetation Type Descriptions

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Woodland Vegetation Types

Bigcone Douglas Fir – Canyon Oak Forest

Stands of this vegetation type have a two-tiered canopy with bigcone Douglas fir (*Pseudotsuga macrocarpa*) dominating the upper canopy layer and canyon live oak (*Quercus chrysolepis*) forming a dense sub-canopy. Coulter pine (*Pinus coulteri*), and, less often, incense cedar (*Calocedrus decurrens*) occur infrequently in the canopy as emergents. The shrub layer is sparse and may contain scrub oaks (*Quercus berberidifolia* and/or *Q. durata* var. *gabrielensis*) or any of several shrub species from the surrounding chaparral. The herbaceous layer is also sparse.

Bigcone Douglas fir is listed by the U.S. Forest Service (USFS) as a Management Indicator Species. The species is restricted to the Transverse and Peninsular Ranges of Southern California, where it occurs in areas that are typically too dry to support other coniferous species. It is almost always associated with canyon live oak (McDonald 1990). Although it has adaptations to withstand fire, such as thick bark and the ability to re-sprout following defoliation by burning, bigcone Douglas fir cannot withstand repeated fires or fires of extreme intensity. Therefore, anthropogenic alteration of the natural fire regime may pose a threat to this vegetation type, in the form of either increased fire intensity due to fire suppression or increased fire frequency due to human activities (Howard 1992). CDFG considers vegetation alliances ("series") dominated by bigcone Douglas fir to be apparently secure globally, but vulnerable to extirpation or extinction within the state of California (CDFG 2007).

Northern Region: This vegetation type does not occur within this region of the proposed project.

Central Region: Stands of Bigcone Douglas Fir – Canyon Oak Forest are limited to the sections of Segments 6 and 11 that traverse the ANF. This vegetation type is widely distributed within this area and often occurs as small isolated stands on slopes or in steep canyons that are surrounded by chaparral communities. Larger, more contiguous stands occur at higher elevations, such as within Segment 11 in the vicinity of Mt. Gleason Road and in portions of Segment 6.

Southern Region: This vegetation type does not occur within this region of the proposed project.

California Walnut Woodland

Stands of California Walnut Woodland are dominated by California walnut (*Juglans californica* var. *californica*) with scattered coast live oak (*Quercus agrifolia*) co-occurring in the canopy. The shrub layer often contains poison oak (*Toxicodendron diversilobum*), Mexican elderberry (*Sambucus mexicana*), and laurel sumac (*Malosma laurina*). The herbaceous layer is typically dominated by non-native grasses.

California walnut is an uncommon species restricted to Southern California. The CNPS (2007) considers it to be of limited distribution, and it has been placed on the watch list, List 4.2. California Walnut

Woodland is regarded by CDFG as vulnerable to extirpation or extinction at both the global and state levels (CDFG 2007).

Northern Region: This vegetation type does not occur within this region of the proposed project.

Central Region: This vegetation type does not occur within this region of the proposed project.

Southern Region: Stands of California Walnut Woodland occur primarily in the areas of the Puente and Chino Hills that are traversed by Segment 8. Many of the California Walnut Woodland stands within the proposed project were very heavily grazed by cattle so that only herbaceous species unpalatable to livestock, such as lupines (*Lupinus* spp.) and milkweeds (*Asclepias* spp.), were observed in the understory during field surveys.

Canyon Oak Forest

Canyon Oak Forests typically occupy steep slopes and are dominated by canyon live oak with occasional bigcone Douglas fir and Coulter pine occurring as scattered emergent species. The shrub layer is generally very sparse and often contains only scattered poison oak. Widely spaced pockets of wood fern (*Dryopteris arguta*) and sword fern (*Polystichum imbricans* ssp. *curtum*) occur regularly in the understory, especially in steep mesic draws. Scarlet keckiella (*Keckiella ternata*) occurs occasionally on roadsides. The surface of the ground is covered with a thick layer of leaf litter and as such, the herbaceous layer is very sparse to non-existent. Very few herbaceous species were observed in this vegetation type during reconnaissance-level surveys of the proposed project. Los Angeles County considers canyon live oaks (and all other *Quercus* spp.) to be a sensitive resource (Los Angeles County Oak Tree Permit Ordinance, Section 22.56.2050).

Northern Region: This vegetation type does not occur within this region of the proposed project.

Central Region: Stands of canyon oak forest are restricted to this region of the proposed project and occupy a significant portion of Segment 6, especially along the southern half of the segment. Along Segment 11, this vegetation type is abundant in the foothills north of the Gould substation and in the vicinity of Mount Gleason Road.

Southern Region: This vegetation type does not occur within this region of the proposed project.

Coast Live Oak Woodland

In this upland vegetation type, the tree canopy is dominated by coast live oak. However, this vegetation type may also contain scattered California walnut, especially in stands occurring in the Southern Region. The shrub layer often contains species typical of the chaparral vegetation that occur on its periphery, and may include toyon (*Heteromeles arbutifolia*), Mexican elderberry, and shrubs belonging to the sumac family (Anacardiaceae) such as laurel sumac and lemonadeberry (*Rhus integrifolia*). Riparian stands dominated by coast live oak differ in species composition and therefore were mapped separately as southern coast live oak riparian forest. Coast live oak trees have been identified by Los Angeles County as a sensitive resource (Los Angeles County Oak Tree Permit Ordinance, Section 22.56.2050).

Northern Region: This vegetation type does not occur within this region of the proposed project.

Central Region: Stands of Coast Live Oak Woodland occur only near the southern boundary of the ANF. Along Segment 11, numerous stands occur between the Gould substation and the area around Eaton Wash. Segment 6 contains just 3 stands of this vegetation type near the transition to Segment 7.

Southern Region: Stands of Coast Live Oak Woodland are abundant in the Puente and Chino Hills along Segment 8. Stands also occur sporadically along Segment 7, and several remnant stands occur along Segment 11 north of the Goodrich substation within the urban environment.

Coulter Pine Forest

Coulter Pine Forest represents 2 distinct vegetation alliances described in the Manual of California Vegetation (Table 2-1; Sawyer and Keeler-Wolf 1995). Stands dominated solely by Coulter pine (Coulter Pine Series) have a one-tiered, open canopy. These vegetation types frequently have a moderately dense shrub layer composed of various chaparral species such as scrub oaks or manzanitas (*Arctostaphylos* spp.), and less often have a closed canopy structure with a sparse understory of shrubs. Vegetation types dominated by both Coulter pine and canyon live oak (Coulter pine - canyon live oak series) have a two-tiered canopy with canyon live oak forming the sub-canopy. These stands typically have sparse shrub and herbaceous layers.

Northern Region: This vegetation type does not occur within this region of the proposed project.

Central Region: Stands of Coulter Pine Forest occupy slopes and ridges at mid to higher elevations (2,000-6,000 feet) within the Central Region of the proposed project.

Southern Region: This vegetation type does not occur within this region of the proposed project.

Joshua Tree Woodland

Joshua Tree Woodland is an open vegetation type dominated by Joshua trees (*Yucca brevifolia*) with an intermittent shrub layer and little herbaceous cover during most of the year. Commonly occurring shrub species include creosote brush (*Larrea tridentata*), California buckwheat (*Eriogonum fasciculatum*), beavertail cactus (*Opuntia basilaris*), cholla (*Opuntia echinocarpa*), big sagebrush (*Artemisia tridentata*), and bladder sage (*Salazaria mexicana*). The herbaceous layer may contain woolly marigold (*Baileya pleniradiata*), cheat grass (*Bromus tectorum*), and many species of ephemeral spring annual wildflowers in years with favorable rainfall. This vegetation type often intergrades with creosote bush scrub, which may contain widely scattered Joshua trees. However, only areas with high densities of Joshua trees were mapped as Joshua Tree Woodland.

Joshua trees are endemic to the Mojave and northwest Sonoran Desert and are adapted to harsh desert conditions, requiring high light, well-drained soils, and limited precipitation. They exhibit slow growth rates with new seedlings growing an average of 3 inches annually for the first 10 years, then slowing to 1.5 inches per year thereafter. While it is difficult to accurately determine the age of individual trees because the trunks of Joshua trees lack annual growth rings, it has been estimated that some trees can live for 200 years or more (USFS 2006a). Joshua trees are very susceptible to disturbance, do not tolerate soil compaction, and are difficult to successfully relocate. Joshua Tree Woodland is listed by the CDFG as

globally "uncommon, but not rare", but is considered vulnerable to extirpation or extinction within the state of California (CDFG 2007).

Northern Region: Joshua Tree Woodland is restricted to the Northern Region of the proposed project where it is most abundant along Segment 10 in widely scattered stands. Stands also occur along Segment 4 between 140th Street West and 150th Street West north of Avenue C, and one isolated stand occurs along Segment 5 north of Amargosa Creek and south of Godde Hill Road.

Central Region: This vegetation type does not occur within this region of the proposed project.

Southern Region: This vegetation type does not occur within this region of the proposed project.

Mojavean Pinyon Woodland

This open woodland vegetation type is dominated by pinyon pine (*Pinus monophylla*) with an open shrub layer often containing Tucker oak (*Quercus john-tuckeri*), mountain mahogany (*Cercocarpus betuloides*), rubber rabbitbrush (*Chrysothamnus nauseosus*), and California juniper (*Juniperus californica*). The herbaceous layer often contains non-native grasses; however, bunchgrasses (*Poa* spp. and *Achnatherum speciosum*) are locally abundant. Although once more extensive within the proposed project, recent fires have burned much of this vegetation type. Recovery of mature stands of this climax vegetation type following fire is very slow (100-150 years; Wangler and Minnich 1996), so many recently burned stands of this type have been mapped as "Mojavean Pinyon And Juniper Woodland, Recently Burned" to reflect the early seral stage represented by the burned areas, and the current dominance of scrub oaks and chamise, which re-sprout quickly following fire (see detailed discussion below).

Northern Region: Stands of Mojavean Pinyon Woodland occur only along the northernmost portions of Segments 6 and 11 in the foothills just south of the Vincent substation where recent fires have greatly reduced the acreage of this vegetation type.

Central Region: Stands of Mojavean Pinyon Woodland occur along the northern portions of Segments 6 and 11 in the foothills south of the Vincent substation. Recent fires have greatly reduced the acreage of this vegetation type in this area.

Southern Region: This vegetation type does not occur within this region of the proposed project.

Non-native Woodland

Stands of either naturalized non-native tree species such as eucalyptus (*Eucalyptus* sp.), pepper tree (*Schinus molle*), and pines (*Pinus* sp.), or planted landscape ornamentals were mapped as non-native woodland. Only stands where trees are in close proximity to, or exist as discrete patches within, natural open space and that could potentially support nesting raptors received this designation. Non-Native Woodland occurs within the project area in recreational areas such as golf courses or maintained public parks. Trees within developed areas were mapped as part of the developed area (see detailed discussion below).

Northern Region: This vegetation type does not occur within this region of the proposed project.

Central Region: Scattered stands of Non-Native Woodland occur along the southern part of Segment 11, and mostly consist of stands of non-native pines, although one stand is located at a restoration site associated with the construction of Big Tujunga Reservoir. There were no stands of this vegetation type mapped along Segment 6.

Southern Region: Numerous stands of this vegetation type have been mapped along each of the segments within this region. The highest concentrations of these stands occur in the Whittier Narrows area along Segments 7 and 8, although many stands also occur in the Puente and Chino Hills along Segment 8. Along Segment 11, stands of this vegetation type occur in the urban environment south of Eaton Wash.

California Bay Forest

Stands of California Bay Forest are uncommon within the proposed project. Only communities that were strongly dominated by California bay (*Umbellularia californica*) were mapped as this vegetation type. While California bay can occur in both upland and riparian habitats, all but one of the stands of this vegetation type within the proposed project were located along the margins of major creeks and were associated with other riparian tree species such as big leaf maple (*Acer macrophyllum*), white alder (*Alnus rhombifolia*), sycamore (*Platanus racemosa*), and coast live oak. Commonly occurring herbs include rushes (*Juncus* spp.), sedges (*Carex* sp.), and mugwort (*Artemisia douglasiana*). The one stand that is not located in a riparian setting occurs on a mesic north-facing slope with abundant near-surface groundwater and a similar set of associated species. While the California Bay Series is considered by CDFG to be "apparently secure" both globally and within the state, stands co-dominated by big-leaf maple or sycamore are listed as vulnerable to extirpation or extinction within California (CDFG 2007).

Northern Region: This vegetation type does not occur within this region of the proposed project.

Central Region: Stands of California Bay Forest are restricted to the Central Region of the proposed project, where a total of 6 stands were mapped along Segment 6. Stands occur along the West Fork of the San Gabriel River, along an unnamed intermittent creek east of Monrovia peak, in Cold Springs Canyon, and on the north-facing slopes of Mt. Bliss.

Southern Region: This vegetation type does not occur within this region of the proposed project.

Shrub-dominated Vegetation Types

Big Sagebrush Scrub

Big sagebrush is a widely distributed species in the western United States that is associated with many vegetation types throughout its range. It occurs both as an important understory shrub in forest and woodland communities and as an emergent shrub in grassland communities (Sawyer and Keeler-Wolf 1995). In stands mapped as Big Sagebrush Scrub within the proposed project, big sagebrush is the sole or dominant shrub, with pinyon pine and California juniper sometimes occurring as emergent trees. Associated shrubs may include rubber rabbitbrush and California buckwheat, and the herbaceous layer may contain non-native annual grasses such as cheat grass. While this vegetation type can occur on a wide variety of substrates throughout its range, within the proposed project, it is most commonly found in sandy or gravely alluvium in the vicinity of creeks or desert wash habitat.

Northern Region: Stands of Big Sagebrush Scrub occur in the Leona Valley area and near Anaverde Creek along Segment 5, and at the northern termini of Segments 6 and 11 in the Kentucky Springs Canyon area just south of the Vincent substation.

Central Region: Stands of Big Sagebrush Scrub occur adjacent to the Angeles Forest Highway in the Kentucky Springs Canyon area just south of the Forest boundary. Additional stands occur near the Aliso Spring picnic area just north of Mill Creek summit.

Southern Region: This vegetation type does not occur within this region of the proposed project.

Chamise Chaparral

Chamise Chaparral is overwhelmingly dominated by chamise (*Adenostoma fasciculatum*) with other shrub species contributing little cover. Co-occurring species may include various chaparral shrubs such manzanitas, scrub oaks, mountain mahogany, or species of *Ceanothus*, but only relatively pure stands of chamise with other species contributing less than about 10% of the total vegetation cover were mapped as chamise chaparral. This vegetation type is adapted to repeated fires because chamise readily stump-sprouts following fire and has seeds that must be fire-scarified to germinate. The shrub canopy of mature stands is densely interwoven with very little herbaceous understory or litter. Chamise Chaparral occurs on shallow, dry soils, on xeric slopes and ridges, and often occurs within a mosaic of other chaparral vegetation types (see the description of mixed chaparral, below).

Northern Region: This vegetation type does not occur within this region of the proposed project.

Central Region: Chamise Chaparral is limited to the Central Region of the proposed project where extensive stands of this vegetation type occur along Segments 6 and 11. Large stands of Chamise Chaparral occur in the central portion of Segment 11 south of Mt. Gleason. The desert-transitional area near Aliso Canyon along Segment 6 contains numerous stands of this vegetation type. Additional stands along Segment 6 are more widely scattered and occur predominantly south of Upper Big Tujunga Canyon.

Southern Region: This vegetation type does not occur within this region of the proposed project.

Coastal Sage Scrub

Communities mapped as Coastal Sage Scrub represent a collection of several distinct vegetation alliances (Table 2-1) (Sawyer and Keeler-Wolf 1995) that may provide suitable habitat for species such as the federally threatened Coastal California Gnatcatcher (*Polioptila californica*). Coastal sage scrub consists of low, mostly soft-woody shrubs, 1.6 to 6.6 feet tall, with a sparse herbaceous layer below. Stands may be dominated by California sagebrush (*Artemisia californica*) or by California buckwheat with black and/or white sage (*Salvia mellifera* and *S. apiana,* respectively) often occurring as associated species. Other shrubs commonly occurring in stands mapped as this vegetation type include sticky monkeyflower (*Mimulus aurantiacus*), chamise, Mexican elderberry, lemonadeberry, and/or laurel sumac. Coastal sage scrub may occur on a variety of slopes and aspects from nearly level hilltops to steep xeric slopes.

Coastal sage scrub is included in several Los Angeles County Significant Ecological Areas (SEAs) and is protected under numerous local ordinances due to the extensive fragmentation and loss of this habitat and

its importance in supporting special-status species. One of the vegetation alliances that may occur within areas mapped as Coastal Sage Scrub, the Sticky Monkeyflower Alliance, is listed by the CDFG as vulnerable to extirpation or extinction at both a global and state-wide level (CDFG 2007).

Northern Region: This vegetation type does not occur within this region of the proposed project.

Central Region: Stands of Coastal Sage Scrub occur in the southern portion of the region at low elevations just inside of the ANF along both Segments 6 and 11.

Southern Region: Extensive stands of Coastal Sage Scrub occur along Segments 7, 8, and 11. The most extensive stands along Segment 7 occur near Irwindale in the vicinity of the Santa Fe Flood Control Basin. Within Segment 8, extensive stands of this vegetation type occur within the Puente and Chino Hills. The stands of coastal sage scrub along Segment 11 occur just to the south of the Forest boundary in the foothills of the San Gabriel Mountains in the area near Eaton Wash.

Desert Saltbush Scrub

Stands of Desert Saltbush Scrub are typically strongly dominated by a single saltbush species (*Atriplex* spp.; Holland 1986), and total vegetation cover is often low. Within the proposed project, cattle saltbush (*Atriplex polycarpa*) and shadscale (*Atriplex confertifolia*) were often dominant, with big sagebrush, bush seepweed (*Suaeda moquinii*), and rubber rabbitbrush occurring as associated species. Desert Saltbush Scrub occurs on fine-textured, poorly drained soils with higher salinity and/or alkalinity than surrounding areas (Holland 1986). In some stands, cracking soils were evident where temporarily ponded water had dried.

Northern Region: Stands of Desert Saltbush Scrub were mapped along Segment 5 just north of Highway 14. The remaining stands all occur in the Antelope Valley near the area where Segments 4 and 10 intersect.

Central Region: This vegetation type does not occur within this region of the proposed project.

Southern Region: This vegetation type does not occur within this region of the proposed project.

Desert Wash

The Desert Wash areas within the proposed project frequently contain little vegetation due to the scouring associated with rainfall events. Shrubs occurring within the drainage channels include California buckwheat, sagebrush, cheesebush (*Hymenoclea salsola*), and rubber rabbitbrush. Desert Wash areas within the proposed project vary from narrow, incised single channels with eroded banks to broadly eroded braided washes with many sub-channels. Although this unique hydrogeomorphic landform is relatively common in parts of the Antelope Valley, much of this habitat has been lost over the last several decades due to development and agricultural practices. Desert Wash habitats can support unique assemblages of plants and wildlife species and play an important role in conveying surface flows to downstream habitats that may support special-status plants such as the alkali mariposa lily (*Calochortus striatus*). Desert Wash habitat is regulated by the CDFG as a sensitive resource.

Northern Region: Desert wash is widespread and abundant throughout Segments 10, 10A, and 10B. It is more widely scattered along Segment 4 and is limited to the Antelope Valley portion of Segment 5.

Central Region: Desert wash areas occur only near the Kentucky Springs Canyon area along Segment 6.

Southern Region: Desert wash does not occur within this region of the proposed project.

Interior Live Oak Scrub

Stands mapped as Interior Live Oak Scrub are dominated by either the shrub variety of interior live oak (*Quercus wislizeni* var. *frutescens*) or by arboreal interior live oaks (*Q. wislizeni* var. *wislizeni*) that have a short stature due to their tendency to re-sprout after fire (Sawyer and Keeler-Wolf 1995). While interior live oak is a common species occurring in many vegetation types within the proposed project, including both forest and chaparral communities, only stands where it occupied the majority of the shrub canopy cover (>50% relative cover) received this designation. Commonly associated shrub species include scrub oaks, white bark ceanothus (*Ceanothus leucodermis*), and canyon live oak. The herbaceous understory in this vegetation type is typically sparse. Los Angeles County considers interior live oaks to be a sensitive resource (Los Angeles County Oak Tree Permit Ordinance, Section 22.56.2050).

Northern Region: This vegetation type does not occur within this region of the proposed project.

Central Region: Interior Live Oak Scrub was only observed within the Central Region of the proposed project where it is most abundant and widely scattered along Segment 6. Along Segment 11, stands of interior live oak scrub occur north of Big Tujunga Canyon on the east-facing slopes above Fall Creek.

Southern Region: This vegetation type does not occur within this region of the proposed project.

Mixed Chaparral

Areas mapped as Mixed Chaparral represent a complex of many separate vegetation alliances recognized and defined in the Manual of California Vegetation (Sawyer and Keeler-Wolf 1995) and in the Forest Service's Ecological Guide to Southern California Chaparral Plant Series (Table 2-1; Gordon and White, 1994). The majority of the larger areas of Mixed Chaparral within the proposed project are mosaics composed of several of these vegetation alliances, where landscape position (i.e. slope and aspect), fire history, and microclimatic variables have influenced the species composition of the smaller stands within the larger Mixed Chaparral mosaic. Four of the chaparral vegetation types mapped in the Proponent's Environmental Assessment (PEA; SCE 2007) have been folded into the Mixed Chaparral vegetation type (Table 2-1) because each was found to represent a similar mosaic of vegetation alliances, and because there was considerable overlap in the alliance-level composition of these communities. For example, stands of the mountain mahogany series (Gordon and White 1994) occur on steep slopes of variable aspect within communities mapped in the PEA (SCE 2007) as "southern mixed chaparral", "coastal sage scrub-chaparral scrub", and "northern mixed chaparral". Similarly, many large stands of the chamise - hoaryleaf ceanothus series (*Adenostoma fasciculatum - Ceanothus crassifolius*; Gordon and White 1994; Sawyer and Keeler-Wolf 1995) occur within communities mapped as both "southern mixed chaparral" and "upper Sonoran ceanothus chaparral".

Stands mapped as Mixed Chaparral are co-dominated by 2 or more shrub species. The most common dominant species in stands of this vegetation type include chamise, bigberry and/or Eastwood manzanita (*Arctostaphylos glauca* and *A. glandulosa*), and species of California lilac (*Ceanothus* sp.). Scrub oaks, chaparral yucca (*Yucca whipplei*), California buckwheat, and yerba santa (*Eriodictyon trichocalyx* or *E. crassifolius*) are often associated with this vegetation type over a wide range of elevations. At lower elevations, shrubs such as lemonadeberry, laurel sumac, and Mexican elderberry may also occur. At higher elevations, flannel bush (*Fremontodendron californicum*) and canyon silk tassel (*Garrya veatchii*) may be locally abundant.

Northern Region: Stands of Mixed Chaparral occur within the northernmost sections of Segments 6 and 11 in the desert foothills of the San Gabriel Range and along Segment 5 in the vicinity of Ritter Ranch. Stands in these desert-transitional areas are dominated by chamise, manzanitas, and California buckwheat. Tucker's oak and chaparral yucca are common associates. The herbaceous layer may contain non-native grasses such as cheat grass and ephemeral, spring annual wildflowers.

Central Region: Large areas of Mixed Chaparral occur along Segments 6 and 11 within the ANF. While the stands mapped as Mixed Chaparral in these areas are similar in overall shrub species composition (see above), dominance varies among individual sites resulting in a complex mosaic of diverse vegetation alliances (Table 2-1). However, stands of nearly pure chamise and stands of scrub oak were mapped separately as Chamise Chaparral and Scrub Oak Chaparral, respectively.

Southern Region: Stands of Mixed Chaparral are restricted to the Chino Hills area of Segment 8. Here, the Mixed Chaparral vegetation type is similar to the low elevation stands described above, but often contains scattered individuals of species such as California sagebrush and sticky monkeyflower, which commonly occur in coastal sage scrub communities.

Mojave Creosote Bush Scrub

Mojave Creosote Bush Scrub is dominated by creosote bush and may contain scattered emergent Joshua trees at low density. Associated shrubs in this vegetation type are widely spaced and often include burro-weed (*Ambrosia dumosa*), brittlebush (*Encelia farinosa*), spiny senna (*Senna armata*), Nevada jointfir (*Ephedra nevadensis*), cheesebush, and box thorn (*Lycium andersonii*). Mojave Creosote Bush Scrub usually occurs on slopes and alluvial fans in areas with well-drained, secondary soils with very low water holding capacity (Holland 1986). Stands of this vegetation type are often quite large, and mapped stands may contain small inclusions of Mojave mixed woody scrub that were not mapped separately.

Northern Region: Mojave Creosote Bush Scrub is restricted to the Northern Region of the proposed project were it occupies the majority of Segments 10, 10A, and 10B. It is also common near the intersection of Segment 10 and Segment 4. Elsewhere, a single isolated stand was mapped just north of Highway 14 along Segment 5.

Central Region: This vegetation type does not occur within this region of the proposed project.

Southern Region: This vegetation type does not occur within this region of the proposed project.

Mojave Mixed Woody Scrub

Mojave Mixed Woody Scrub is an open scrub vegetation type that may contain several shrub species that also occur in other nearby communities (Holland 1986). Typical dominant shrubs include California buckwheat and bladderpod (*Isomeris arborea*). Other commonly associated shrubs include Nevada jointfir, beavertail cactus, bladder sage, and narrowleaf goldenbush (*Ericameria linearifolia*). Scattered emergent Joshua tree and California juniper are also common in this vegetation type. The herbaceous layer commonly contains annual grasses such as cheat grass, and may contain several species of ephemeral spring annual wildflowers following spring rains.

Northern Region: Stands of Mojave Mixed Woody Scrub occur only in the Northern Region along Segment 5. All of these stands are widely scattered throughout the area between the Vincent substation and Portal Ridge near where the California aqueduct crosses the alignment.

Central Region: This vegetation type does not occur within this region of the proposed project.

Southern Region: This vegetation type does not occur within this region of the proposed project.

Mojavean Juniper Woodland and Scrub

Mojavean Juniper Woodland and Scrub is an open vegetation type dominated by California juniper. While this vegetation type is described as a woodland, California juniper can be considered to be a either a shrub or a low tree with a maximum height of about 13 feet (Hickman 1993). Other shrubs commonly occurring in this vegetation type include big sagebrush, California buckwheat, Nevada jointfir, box thorn, and chaparral yucca. The herbaceous layer is dominated by annual grasses such as cheat grass and may contain jimson weed (*Datura wrightii*) and annual spring wildflowers. Mojavean Juniper Woodland and Scrub occurs on gentle slopes or alluvium and may intergrade with Joshua Tree Woodland or Creosote Bush Scrub on drier soils (Holland 1986).

Northern Region: Stands of Mojavean Juniper Woodland and Scrub occur along the northern portion of Segment 4 and are abundant throughout Segment 5. The northern portions of Segments 6 and 11 near the Antelope substation and north of the ANF boundary also contain this vegetation type.

Central Region: Stands of this vegetation type occur only within the northernmost portions of Segments 6 and 11 near the Vincent substation. This vegetation type is more abundant north of the ANF Boundary.

Southern Region: This vegetation type does not occur within this region of the proposed project.

Mojavean Pinyon and Juniper Woodland, Recently Burned

Many chaparral and some woodland shrubs have developed basal sprouting adaptations such as basal burls that allow for resprouting following fire (Keeley and Davis 2007). In these species, buds near the base of shrubs that survive a fire are released from dormancy to regenerate a mature crown relatively quickly. Other shrub species are obligate seeders adapted to post-fire seedling recruitment, and some species may both resprout and recruit via seeds following fire (Keeley and Davis 2007).

Stands mapped as Mojavean Pinyon and Juniper Woodland, Recently Burned had been burned within approximately the past 5 years and were dominated by resprouting shrubs at the time of the survey. All

of these stands are located within the Central Region in the desert-transitional areas of Segments 6 and 11 just south of the Vincent Substation. The majority of these stands would have been classified as Mojave pinyon woodland or Mojave juniper woodland prior to the fire. However, recovery of mature pinyon-juniper woodlands following fire is very slow (100-150 years; Wangler and Minnich 1996), and stands may be converted to a new vegetation type following burning (Miller and Tauch 2001, Brooks and Pyke 2001). Consequently, many of these areas were mapped as Mojavean Juniper and Pinyon Woodland, Recently Burned to reflect the early, transitional, post-fire stage of the recovering community. A few stands of recently burned mixed chaparral and recently burned chamise chaparral that were dominated by resprouting shrubs at the time of reconnaissance-level surveys were also given this designation. The vegetation in all of these areas is currently dominated by resprouting Tucker oaks and chamise, with an understory of deerweed (*Lotus scoparius*), chia (*Salvia columbariae*), annual grasses such as cheat grass, and native perennial grasses such as desert stipa (*Achnatherum Speciosum*).

Northern Region: This vegetation type does not occur within this region of the proposed project.

Central Region: All of the stands of this vegetation type are located within the Central Region in the desert-transitional areas of Segments 6 and 11 just south of the Vincent Substation.

Southern Region: This vegetation type does not occur within this region of the proposed project.

Mule Fat Scrub

Mule Fat Scrub is tall, herbaceous, riparian scrub strongly dominated by mulefat (*Baccharis salicifolia*). This early seral vegetation type is maintained by frequent flooding, and without persistent water most stands would succeed to cottonwood or sycamore dominated riparian forests or woodlands. Common associates in the shrub layer include sandbar and/or arroyo willow (*Salix exigua*, *S. lasiolepis*). The herbaceous layer may contain sedges, rushes, and stinging nettle (*Urtica* sp.) (Holland 1986). Mule Fat Scrub occurs on intermittent stream channels with fairly coarse substrate and moderate depth to the water table.

Northern Region: This vegetation type does not occur within this region of the proposed project.

Central Region: Mule Fat Scrub occurs infrequently and only in the southernmost portion of Segment 11 in the vicinity of Eaton Wash.

Southern Region: Many stands of Mule Fat Scrub occur within the San Gabriel River channel along Segment 7. Along Segment 8, several stands occur in the Whittier Narrows area, and a few isolated stands also occur east of the Chino Hills.

Rabbitbrush Scrub

Stands of Rabbitbrush Scrub are overwhelmingly dominated by rubber rabbitbrush. Other shrub species that may be present at low cover may include big sagebrush, saltbush, and California buckwheat. Cheat grass often occurs in the herbaceous understory. Rabbitbrush Scrub is a disturbance-related vegetation type (Holland 1986) that occurs along roadsides and in areas that have been disturbed by fire, grading or other soil disturbance, or heavy grazing.

Northern Region: Rabbitbrush Scrub is restricted to the Northern Region of the proposed project where it occurs along all of the segments. In Segment 5 it occurs just north of the Vincent substation and in the Antelope Valley north of the California Aqueduct. Along Segment 4, stands occur in the vicinity of the intersection of 40th Street West and Avenue D. Many stands of this vegetation type occur along Segments 10, 10A, and 10B, with the largest stands occurring near the intersection of 170th Street West and Rosamond Boulevard and along the Los Angeles Aqueduct.

Central Region: This vegetation type does not occur within this region of the proposed project.

Southern Region: This vegetation type does not occur within this region of the proposed project.

Riversidean Alluvial Fan Sage Scrub

Riversidean Alluvial Scrub vegetation occurs in sandy, rocky alluvial deposits in major outwash fans along the coastal side of the San Gabriel, San Bernardino, and San Jacinto Mountains (Hanes et al. 1989). The shrub and sub-shrub species that dominate these communities are adapted to the periodic flooding and scouring that occurs during winter rains, as well as to the low soil fertility associated with sand substrates. Riversidean Alluvial Fan Sage Scrub is characterized by the presence of scalebroom (*Lepidospartum squamatum*), a shrub species with a high fidelity for alluvial substrates (Hanes et al. 1989). Smith (1980) studied the alluvial scrub vegetation of the San Gabriel River flood plain and described 3 major subcategories of this vegetation type: the "pioneer zone," the "intermediate zone," and the "mature zone." The pioneer zone is the youngest zone located near the active wash channel, and is typically sparsely vegetated and composed of young perennials. Immediately above the wash is the intermediate zone, which forms a uniform and relatively dense plant cover of buckwheat with scattered emergent shrubs. The mature zone flanks the wash and is dominated by evergreen shrubs. This zone contains the highest species diversity as well as the most complex canopy structure (Smith 1980).

Riversidean Alluvial Fan Sage Scrub may provide suitable habitat for species such as the federally listed Coastal California Gnatcatcher. The CDFG considers stands dominated by scalebroom to be uncommon, but not rare, and apparently secure both globally and within the state (CDFG 2007).

Northern Region: This vegetation type does not occur within this region of the proposed project.

Central Region: This vegetation type does not occur within this region of the proposed project.

Southern Region: Within the proposed project, Riversidean Alluvial Fan Sage Scrub is restricted to the San Gabriel River channel along Segment 7. All of the stands in this area closely match the "pioneer zone" vegetation type described by Smith (1980). The stands are dominated by a sparse cover of scalebroom with scattered mulefat and very little herbaceous cover. The total vegetation cover in these stands is very low, and all of the stands appear likely to be subject to frequent flooding because of their position in the channel bottom.

Scrub Oak Chaparral

Stands of Scrub Oak Chaparral are strongly dominated by scrub oak, with only a relatively low cover of other shrub species. While shrubby interior live oak is also often present, it contributes little cover relative to the other oaks. Other commonly associated shrub species may include many of the shrubs

from the chaparral communities that are often adjacent to stands of this type. These species include manzanita, mountain mahogany, chamise, toyon, California lilac species, and poison oak, among others (Gordon and White 1994). However, the total cover of associated shrub species is low (<20%) in stands mapped as Scrub Oak Chaparral. Stands with higher cover of associated chaparral shrub species were mapped as the Mixed Chaparral type. A thick layer of litter and a sparse herbaceous layer are typically present in these stands (Gordon and White 1994).

In the southern foothills of the San Gabriel Mountains many stands of this vegetation type contain San Gabriel oak, a CNPS List 4.2 species that is geographically restricted to this area. However, this species hybridizes with scrub oak and distinguishing between the species is often difficult. Los Angeles County considers scrub oaks with a stem diameter of 8 inches or more at breast height a sensitive resource (Los Angeles County Oak Tree Permit Ordinance, Section 22.56.2050).

Northern Region: This vegetation type does not occur within this region of the proposed project.

Central Region: Scrub Oak Chaparral is found predominantly in the Central Region of the proposed project where it occurs throughout the ANF. Along Segment 11 the majority of stands occur in the southern foothills of the San Gabriel Mountains. Additional stands occur in the northern portion of Segment 11 on north-facing slopes in the vicinity of Forest Road 4N24 south of Aliso Canyon Road. Stands are common and widely distributed along the length of Segment 6 within the ANF.

Southern Region: Very few stands of Scrub Oak Chaparral occur in the Southern Region of the proposed project. One stand occurs adjacent to the ANF Boundary where Segment 6 transitions to Segment 7, and another stand occurs in the vicinity of the ANF boundary just north of the Gould substation along Segment 11.

Riparian Vegetation Types

Freshwater Marsh

The Freshwater Marsh vegetation type is dominated by perennial, emergent monocots, often forming dense canopies of tules (*Scirpus* spp.) and cattail (*Typha* spp.). Marshes form in areas permanently flooded by fresh water, lacking significant current, and with prolonged saturation that permits accumulation of deep, organic soils (Holland 1986).

Northern Region: This vegetation type does not occur within this region of the proposed project.

Central Region: This vegetation type does not occur within this region of the proposed project.

Southern Region: The Freshwater Marsh vegetation type is restricted to the Whittier Narrows recreation area, where small areas were mapped along both Segments 7 and 8.

Ruderal Wetland

Areas mapped as Ruderal Wetland typically consist of degraded, freshwater marshes and seasonal wetlands that have been significantly disturbed. In addition to some native wetland species such as rushes, non-native ruderal species such as curly dock (*Rumex crispus*) or prickly ox-tongue (*Picris echioides*) also commonly occur.

Northern Region: This vegetation type does not occur within this region of the proposed project.

Central Region: This vegetation type does not occur within this region of the proposed project.

Southern Region: Ruderal Wetlands are most abundant along the southern portion of Segment 7 in the vicinity of the San Gabriel River channel. Several isolated and widely spread areas of ruderal wetland also occur along Segment 8, usually within urban areas.

Exotic-Giant Reed

Stands mapped as Exotic-Giant Reed are dominated by dense, impenetrable thickets of giant reed (*Arundo donax*), with few or no other species present. Giant reed is a non-native, bamboo-like, perennial grass that grows up to 26 feet tall. It most often occurs in riparian corridors and has become a serious problem throughout California. Large stands can increase the risk of fire, significantly reduce water availability in streams, displace native vegetation, diminish wildlife habitat, and increase flooding and siltation in natural areas (DiTomaso and Healy 2007).

The USFS considers giant reed to be an invasive weed of high concern for its severe impacts on ecosystems, plant and animal communities, and vegetation structure (USFS 2006b).

Northern Region: Although isolated patches of giant reed occur within the project area, none of these infestations were extensive enough to warrant mapping as this vegetation type, and thus no Exotic-Giant Reed stands have been mapped within the Northern Region of the proposed project.

Central Region: Although isolated patches of giant reed occur within the project area, none of these infestations were extensive enough to warrant mapping as this vegetation type, and thus no Exotic-Giant Reed stands have been mapped within the Central Region of the proposed project.

Southern Region: Large stands of Exotic-Giant Reed exist within the channel of the San Gabriel River near the Whittier Narrows area traversed by Segments 7 and 8. These stands were large enough to warrant mapping as a distinct vegetation type.

Southern Arroyo Willow Riparian Forest

Stands of vegetation dominated by arroyo willow were mapped as Southern Arroyo Willow Riparian Forest. In these stands arroyo willow occurs as a tree-like shrub, with scattered emergent cottonwood also present at times. The shrub layer consists of often dense, shrubby willows and/or mule fat, and the herbaceous understory may include rushes, sedges, mugwort, and stinging nettle. The stands typically occur near stream channels on broad drainages or floodplains on sandy or gravelly alluvial soils.

Northern Region: This vegetation type does not occur within this region of the proposed project.

Central Region: Only a single stand of Southern Arroyo Willow Riparian Forest was mapped. The stand occurs in Upper Big Tujunga canyon along Segment 6 just north of Highway 2.

Southern Region: Several stands of Southern Arroyo Willow Riparian Forest occur along Segment 8 in the Whittier Narrows area, and along Segment 7 just to the north of the Whittier Narrows. In the Puente and Chino Hills area along Segment 8, stands occur just to the east of Highway 57 and in the area to the northwest of Carbon Canyon. Another stand occurs near the city of Chino near Little Chino Creek.

Southern Cottonwood Willow Riparian Forest

Southern Cottonwood Willow Riparian Forest is dominated by Fremont cottonwood (*Populus fremontii*) and tree willows such as red willow (*Salix laevigata*). Other associated tree species may include California sycamore, white alder, and coast live oak. The shrub layer is typically dominated by willows, and the understory herbaceous layer may contain rushes, sedges, stinging nettle, and mugwort. The dominant species require moist, bare mineral soil for germination and establishment. Such soil conditions occur following a flood event, leading to uniform aged stands within this vegetation type (Holland 1986). Vegetation series dominated by Fremont's cottonwood are considered "apparently secure globally, but vulnerable to extirpation or extinction within the state of California" (CDFG 2007).

Northern Region: Southern Cottonwood Willow Riparian Forest is restricted to Segment 5, where stands were mapped along Amargosa Creek in the Leona Valley and along an unnamed tributary to Amargosa Creek to the south. Another stand was mapped along an unnamed tributary to Anaverde Creek in the Pelona Ridge area.

Central Region: Stands of Southern Cottonwood Willow Riparian Forest occur in the Aliso Canyon area along Segments 6 and 11.

Southern Region: A single stand of Southern Cottonwood Willow Riparian Forest was mapped along Segment 8 in the Whittier Narrows area.

Southern Sycamore - Alder Riparian Woodland

In stands of Southern Sycamore - Alder Riparian Woodland, widely spaced California sycamore is the dominant tree in the canopy with white alder frequently present. Other trees that may be associated with this vegetation type include California bay and big leaf maple. The canopy is frequently open and a shrub layer of willows, mulefat, and mugwort is often present. Woody vines within the vegetation type may include California blackberry (*Rubus ursinus*), poison oak, and wild grape (*Vitis girdiana*) (Holland 1986). The herbaceous understory may include rushes and sedges. This vegetation type typically occurs in rocky streambeds subject to seasonal flooding, with the abundance of alders increasing in more perennial streams (Holland 1986). Southern sycamore - alder riparian woodland is listed by the CDFG as "rare and worthy of consideration by CNDDB" (CDFG 2004). Furthermore, any vegetation series dominated by California sycamore are considered "apparently secure globally, but vulnerable to extirpation or extinction within the state of California" (CDFG 2007).

Northern Region: This vegetation type does not occur within this region of the proposed project.

Central Region: Stands of Southern Sycamore - Alder Riparian Woodland are associated with many of the streams and creeks along Segments 6 and 11. The vegetation type is common in the southern part of the Central region and absent from the desert-transitional areas to the north.

Southern Region: Several stands of Southern Sycamore - Alder Riparian Woodland occur in the Whittier Narrows area along both Segments 7 and 8. In the Puente and Chino Hills area, only 2 stands of this vegetation type occur within the proposed project. One stand occurs near Turnbull Canyon, and the other in Powder Canyon southeast of Fullerton Road.

Southern Willow Scrub

Areas mapped as Southern Willow Scrub consist of dense stands of shrubby willows with scattered emergent cottonwood and California sycamore. The dominant willow species are typically arroyo and sandbar willows. Associated species in the herbaceous understory layer may include rushes, sedges, mugwort, and stinging nettle. The stands typically occur near stream channels on sandy or gravelly alluvial soils. This early seral type requires repeated flooding to prevent succession to forest or woodland riparian habitat types (Holland 1986).

Northern Region: This vegetation type does not occur within this region of the proposed project.

Central Region: Stands of Southern Willow Scrub occur along the margins of creeks and intermittent streams at widely scattered locations throughout both Segments 6 and 11.

Southern Region: Along Segment 11, a single stand of Southern Willow Scrub occurs in the vicinity of Eaton Wash. Many stands of this vegetation type occur in the Whittier Narrows area along Segments 7 and 8. Elsewhere, a few widely scattered stands occur along Segment 7 near the San Gabriel River. In the Puente and Chino Hills area one stand was mapped just east of Fullerton Road along Segment 8, and several stands were mapped along the proposed project in an unnamed intermittent creek northwest of Carbon Canyon.

Herbaceous Vegetation types

Bunchgrass Grassland

Stands of bunchgrass grassland are dominated by native perennial bunchgrasses such as purple needlegrass (*Nassella pulchra*). Although once more widespread in California, the majority of native grasslands in the state have been replaced by introduced annual grasses. Stands dominated by purple needlegrass often occur on deep soils with a high clay content (Sawyer and Keeler-Wolf 1995) and may be co-dominated by introduced annual grasses such as soft chess (*Bromus hordeaceus*) and ripgut brome (*B. diandrus*). Only grasslands where the cover of native grasses exceeded 10% of the total cover were mapped as Bunchgrass Grassland. Stands of this vegetation type may support diverse displays of annual wildflowers in the spring of years with sufficient rainfall. The CDFG considers stands of the purple needlegrass alliance to be globally uncommon but not rare, but vulnerable to extirpation or extinction within the state (CDFG 2007).

Northern Region: This vegetation type does not occur within this region of the proposed project.

Central Region: This vegetation type does not occur within this region of the proposed project.

Southern Region: Bunchgrass Grassland was only observed in Segment 8 in the Puente and Chino Hills. Stands of this vegetation type occur near the intersection of Colima Road and Skyline Drive, approximately 2 miles east of Fullerton Road and south of Eucalyptus Avenue, just west of its intersection with Rancho Hills Drive. The floristic composition of these stands was very difficult to determine during the field surveys of the alignment because of the low rainfall totals during the 2006-2007 growing season (NWS 2007), and herbaceous removal as a result of heavy cattle grazing.

California Annual Grassland

Stands of vegetation dominated primarily by non-native annual grasses were mapped as California Annual Grassland (Sawyer and Keeler-Wolf 1995). Although floristic composition is variable among stands of this vegetation type, typical dominants include soft chess, cheat grass, ripgut brome, and foxtail chess (*B. madritensis*). Other dominant and/or abundant species may include wild oats (*Avena* spp.) and filarees (*Erodium botrys*, *E. cicutarium*). In years of favorable rainfall some stands of this vegetation type may support numerous species of native annual spring wildflowers (Holland 1986) which could be mapped as Wildflower Fields, a CDFG sensitive habitat (Holland 1986, CDFG 2003).

Northern Region: Stands of California Annual Grassland are restricted to Segments 4 and 5 and were not observed along Segment 10. The majority of Segment 4 is comprised of annual grasslands dominated by cheat grass often with widely scattered shrubs of rubber rabbitbrush. The majority of these areas were once used for agricultural production, but have been fallow for many years. Along Segment 5, large areas of California annual grassland occur in the hills to the south of the Leona Valley.

Central Region: The vegetation within this region predominantly consists of forest and chaparral communities and contains very few grasslands. Along both Segments 6 and 11, areas mapped as California Annual Grassland are few and widely scattered. Although the majority of these areas are associated with clearing or disturbance, they were not mapped as ruderal grassland because of their likelihood to support populations of native plants.

Southern Region: Stands of California Annual Grassland are common along Segment 8 within the Puente and Chino Hills, but occur infrequently along the other segments. Many of the stands occurring along Segment 8 are used for grazing cattle, and the combination of the dry conditions during the 2006-2007 growing season (NWS 2007) and grazing prior to the surveys resulted in very poor conditions for determining the floristic composition of these stands.

Deerweed and Chia Herbaceous Field, Recently Burned

Stands of vegetation that were recently burned (<5 years) and dominated by herbaceous species and/or seeding sub-shrubs were mapped as Deerweed and Chia Herbaceous Field, Recently Burned (Brooks 1999, Brooks and Pyke 2001). These areas were dominated by native chia and deerweed but also supported non-native grasses; including foxtail chess, cheat grass, and common Mediterranean grass (*Schismus barbatus*). Some scattered resprouting Tucker oaks and chamise may occur at low cover in these stands, but these species were not abundant enough to dominate the vegetation upon their regrowth. The composition of the stands mapped as Deerweed and Chia Herbaceous Field, Recently Burned is expected to become more dominated by non-native annual plants as these communities mature (Brooks and Pyke 2001, Brooks et al. 2004).

Northern Region: One small stand of this community spanning the ANF boundary occurs in the Kentucky Springs Canyon area south of the Vincent substation.

Central Region: Stands of this community were mapped in the recently burned areas along Segments 6 and 11 in the vicinity of Kentucky Springs just inside of the ANF boundary to the south of the Vincent substation.

Southern Region: This vegetation type does not occur within this region of the proposed project.

Desert Bunchgrass Grassland

This vegetation type is dominated by desert stipa with large, bare interspaces between bunchgrasses. Scattered shrubs occur throughout this vegetation type and may include California buckwheat, brittlebush, and rubber rabbitbrush. Desert Bunchgrass Grassland frequently occurs adjacent to Mojave creosote bush scrub and Joshua tree woodland, often forming a mosaic with these types. This vegetation type may support ephemeral annual spring wildflowers in years with favorable rainfall. CDFG considers vegetation series dominated by desert stipa to be "apparently secure globally, but vulnerable to extirpation or extinction within the state of California" (CDFG 2007)

Northern Region: Desert Bunchgrass Grassland occurs only in the Northern Region of the proposed project along Segment 10 where the largest stands occur northeast of Tehachapi Willow Springs Road.

Central Region: This vegetation type does not occur within this region of the proposed project.

Southern Region: This vegetation type does not occur within this region of the proposed project.

Ruderal Grassland

Stands mapped as Ruderal Grassland include areas that are subject to repeated ground disturbance and areas dominated non-native species adapted to such disturbance conditions. The dominant species in these areas often include brome grasses such as ripgut brome and foxtail chess, Russian thistle (*Salsola tragus*), horseweed (*Conyza canadensis*), and filaree. In addition to these highly disturbed areas, stands dominated by black and/or shortpod mustard (*Brassica nigra* and/or *Hirschfeldia incana*) were mapped as ruderal grassland because of the dominance of these ruderal species and their generally low probability of supporting populations of native plants.

Northern Region: Ruderal Grassland was only mapped on the grounds of the Vincent substation.

Central Region: Only one stand of Ruderal Grassland was mapped near the Los Angeles County Fire Camp on Mount Gleason Road.

Southern Region: Stands of Ruderal Grassland occur along Segment 11 in the Eaton Wash area within the City of Pasadena. Along Segment 7, areas of Ruderal Grassland occur throughout much of the proposed project within the larger channel area of the San Gabriel River. Similarly, many stands of this vegetation type are scattered throughout Segment 8. Extensive stands of Ruderal Grasslands dominated by black mustard occur in the Puente and Chino Hills area traversed by Segment 8.

Sparsely Vegetated Streambed

Outside of the Mojave Desert region, areas within streambeds or drainage channels that were nearly devoid of vegetation were mapped as Sparsely Vegetated Streambed. These areas include the beds of intermittent creeks as well as channels of larger rivers that convey water only periodically during high flows. Plant species observed in these areas include willows, mule fat, and sparse annual grasses and forbs adapted to ruderal conditions. This is in contrast to the similar vegetation type in the Mojave Desert

region that was mapped as desert wash, which supports a unique assemblage of plants species that differ from those observed within the sparsely vegetated streambed.

Northern Region: Sparsely Vegetated Streambed areas in this region were mapped as desert wash.

Central Region: Sparsely Vegetated Streambed areas were mapped along Segment 11 along the North Fork of Mill Creek. Along Segment 6 this vegetation type occurs in an unnamed intermittent creek adjacent to Lynx Gulch Road.

Southern Region: Areas of Sparsely Vegetated Streambed occur along Segment 11 within the Eaton, San Gabriel, and Alhambra washes. Along Segment 7 many of these areas occur within the San Gabriel River Channel. Along Segment 8, this vegetation type was mapped only near Chino in a channelized portion of Cucamonga Creek.

Anthropogenic Vegetation types

Agriculture

Irrigated crops, dairies, feedlots, and disked fields were mapped as Agriculture. Areas receiving this designation are used to produce a variety of agricultural commodities. However, container nurseries were mapped separately as developed areas. Some of the crops observed during surveys of the proposed project include alfalfa (*Medicago sativa*), sorghum (*Sorghum bicolor*), maize (*Zea maize*), and carrot (*Daucus carota*).

Northern Region: Large areas of Agriculture occur within Segment 4 from near Gaskell Street south to just north of Avenue B. Additional small areas of Agriculture occur along Segment 4 around Avenue F and along Segment 5 just north of Avenue L.

Central Region: The Central Region of the proposed project does not contain any agricultural areas.

Southern Region: Agricultural areas occur along Segment 8 in the Whittier Narrows area, near Rose Hills Memorial Park, and southeast of the city of Chino, where many dairies are located. Along Segment 7, an agricultural area occurs adjacent to the San Gabriel River in the City of Arcadia.

Barren/Developed

A variety of areas lacking natural vegetation were mapped as Barren/Developed. Urban areas, structures, and paved roads are common examples of the features receiving this designation. Landscaped areas associated with development, container nurseries, areas of bare ground, areas supporting a sparse cover of ruderal plant species due to repeated ground disturbance, and areas with heavily compacted soil, such as unpaved or gravel roads were all mapped as Barren/Developed. All of the areas receiving this designation were judged to generally have a very low probability of supporting native plant or wildlife species.

Northern Region: Barren/Developed areas occur throughout the proposed project within this region. While there are very few structures, there are numerous roads, most of them unpaved, that have been mapped using this designation.

Central Region: The majority of the areas mapped as Barren/Developed are unpaved forest roads or one of the paved highways traversing the forest. These roads occur evenly throughout the proposed project along both Segment 6 and Segment 11.

Southern Region: This region of the proposed project contains large tracts of urban development within the greater Los Angeles area that have been mapped as Barren/Developed. The areas supporting native vegetation along Segment 8 in the Puente and Chino Hills contain numerous roads within the buffer around the proposed project that were also mapped using this designation.

Literature Cited

[USFWS] U.S. Fish & Wildlife Service. 2005. Endangered and threatened wildlife and plants: Designation of critical habitat for *Brodiaea filifolia* (thread-leaved brodiaea); Final Rule. Federal Register 70 (238): 71283-71319.

Brooks, M. L. 1999. Alien annual grasses and fire in the Mojave Desert. Madroño 46:13-19.

Brooks, M. L., and D. A. Pyke. 2001. Invasive plants and fire in the deserts of North America. In: K. E. M. Galley and T. P. Wilson (eds). Proceedings of the Invasive Species Workshop: The Role of Fire in the Control and Spread of Invasive Species. Fire Conference 2000: The First National Conference on Fire Ecology, Prevention, and Management. Pp 1-14. Miscellaneous Publication No. 11. Tall Timbers Research Station: Tallahassee, Florida.

Brooks, M. L., C. M. D'Antonio, D. M. Richardson, J. B. Grace, J. E. Keeley, J. M. DiTomaso, R. J. Hobbs, M. Pellant, and D. A. Pyke. 2004. Effects of invasive alien plants on fire regimes. Bioscience 54:677-688.

[CDFG] California Department of Fish and Game. 2007. The Vegetation Classification And Mapping Program List of California Vegetation Alliances. California Department of Fish and Game, Vegetation Classification and Mapping Program, Sacramento, California.

[CNPS] California Native Plant Society. 2007. Inventory of Rare and Endangered Plants (online edition, v7-07c). California Native Plant Society. Sacramento, California. <http://www.cnps.org/inventory>

DiTomaso, J. and Healy, E. 2007. Weeds of California and Other Western States. University of California Agriculture and Natural Resources Publication 3488, Oakland, California.

Gordon, H. and T. C. White. 1994. Ecological Guide to Southern California Chaparral Plant Series. USDA Forest Service Pacific Southwest Region. Publication R5-ECOL-TP-005.

Hanes, T., R. Friesen, and K. Keane. 1989. Alluvial scrub vegetation in Coastal Southern California. USDA Forest Service General Technical Report PSW-110.

Hickman, J. 1993. The Jepson Manual: Higher Plants of California. University of California Press, Berkeley, California.

Holland, R. 1986. Preliminary descriptions of the terrestrial natural communities of California. State of California, The Resources Agency, Department of Fish and Game.

Howard, J. L. 1992. *Pseudotsuga macrocarpa*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). <http://www.fs.fed.us/database/feis/> (Accessed 29 and 30 October 2007).

Keeley J. E. and F. W. Davis. 2007. Chaparral. In: Barbour, M., Keeler-Wolf, T., and A. Schoenherr (eds). Terrestrial Vegetation of California, 3rd ed. University of California Press: Berkeley, California.

McDonald, P. M. 1990. *Pseudotsuga macrocarpa* (Vasey) Mayr. bigcone Douglas-fir. In: Burns, Russell M.; Honkala, Barbara H. (tech. Coordinators). Silvics of North America. Volume 1.

Conifers. Agric.Handb. 654. U.S. Department of Agriculture, Forest Service: 520-526. [13412]: Washington, DC.

Miller, R. F., and R. J. Tauch. 2001. The role of fire in juniper and pinyon woodlands: a descriptive analysis. In: K. E. M. Galley and T. P. Wilson (editors). Proceedings of the Invasive Species Workshop: The Role of Fire in the Control and Spread of Invasive Species. Fire Conference 2000: The First National Conference on Fire Ecology, Prevention, and Management. Pp 15-30. Miscellaneous Publication No. 11. Tall Timbers Research Station: Tallahassee, Florida.

[NWS] National Weather Service. 2007. Unique Local Climate Data, Los Angeles, California. <http://www.weather.gov/climate/local_data.php?wfo=lox> (Accessed 10 October 2007).

Sawyer, J. O., and T. Keeler-Wolf. 1995. A Manual of California Vegetation. California Native Plant Society. Sacramento, California.

Smith, R. L. 1980. Alluvial Scrub Vegetation of the San Gabriel River Floodplain, California. Madroño 27:126-138.

[USFS] United States Forest Service. 2006a. Botanical and Ecological Characteristics of Joshua tree (*Yucca Brevifolia*). <http://www.fs.fed.us/database/feis/plants/tree/yucbre/botanical_and_ecological_characteristics.html>

[USFS] United States Forest Service. 2006b. Memo from the Angeles National Forest: Invasive weeds found on or near Angeles National Forest Land. March 2006.

Wangler M. J., and R. A. Minnich. 1996. Fire and Succession in Pinyon-Juniper Woodlands of the San Bernardino Mountains, California. Madroño 43: 493-514.